

# Role of Standards for SEEDS

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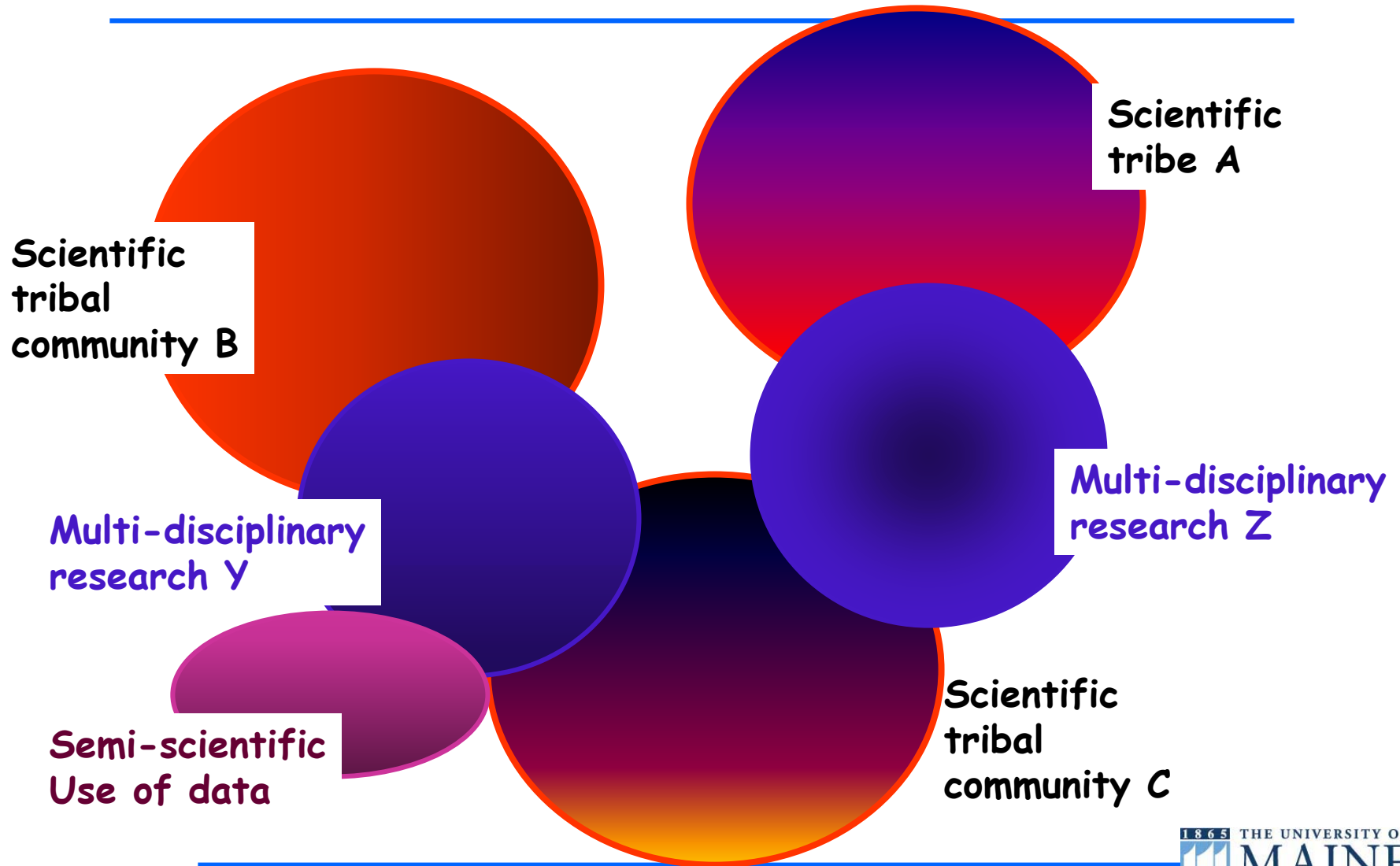
# Motivation

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- ESE *collects, maintains, distributes, and analyzes* massive amounts of geophysical data sets
- ESE includes many diverse ‘scientific tribes’
  - Highly specialized small scientific communities
  - More and more multi-disciplinary research
- In search of the next generation infrastructure
  - Allows to access, process and distribute data and results faster, more flexibel, and convenient

# Interoperability and SEEDS

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# Motivation

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- The ‘next generation infrastructure’:
  - Easier, fast search for and (online) access to data
  - Simpler data subsetting and integration
  - Allows for organic growth of infrastructure
  - Allows for specialization of ‘tribes’
  - Accommodates new scientific interests
  - Provides for interoperability and re-use of tools, data, mechanisms
  - ‘Cheaper’ and faster turn-around’

 *Standards help here*

# Requirements for Standards

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- Standards should make the task **simpler**
  - Let scientific tribes do things in their familiar, specialized way, does not hamper specialization
  - Makes tasks for multi-disciplinary groups simpler
  - Allows all groups to re-use tools, and mechanisms
  - ‘Light touch’
  - Adaptiveness, and flexibility
- Necessary
  - Common set of *minimal standardized interfaces* to bridge/‘translate’ between differences
  - *Processes* to find, define, and implement them
  - Community Engagement

# Soo.....

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- “Good” standards make life simpler.
- What are the pitfalls?
  - The standard has to be the right ‘fit’ (what to standardize ?)
  - Provide tools that help using the standard, or even hide it
  - It takes a lot of effort and resources to develop and maintain standards.
  - Community acceptance is necessary
  - Continuously new technology, instruments, mechanisms,...
- ➔ Need for *Standard Process Models*
  - What works, what does not?
  - We cannot know in advance which standards will evolve or be necessary, but we need a process model and standards body that enable the evolvement.

# How to get 'good' standards?

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- Essential to process: **'Community Engagement'**
  - Community-based development is necessary (experts!)
    - The need has to come out of the community.
    - Small teams of experts from community.
  - The standard has to be the right 'fit': concrete needs
  - Small is beautiful: fast turn-around of problem specification, testing, standardization
  - Open, democratic process
    - Everyone can suggest a standard
    - Each standard can be commented on by every community member
  - Motivate community to accept standard rather than enforce
  - Open source and/or public domain tools are essential

# Lessons learned: What does not work well?

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- If scope of standard is too large/too complex
- Problems/needs are not concrete and clear
  - why is data interoperability hard?
- Turn-around too long
  - Better smaller scope, and evolution
- Working groups too big
- Someone 'owns' the process and/or the standard
  - Others have only 'advisory' input
- Trying to come up with the best fit solution in a 50 experts group discussion
  - People tend not to agree, and like to discuss. Tedious.
  - No implementation



# Examples for Successful Standards

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## IETF (Internet Engineering Task Force)

- Background:
  - 1980s: Many isolated computer networks (arpanet, uunet,...)
  - 1986: how can these networks be used seamlessly?
  - → Internet
- IETF as community-born organization:
  - “The Internet Engineering Task Force is a **loosely self-organized** group of people **who contribute to the engineering and evolution** of Internet technologies.”
  - “The IETF is not a traditional standards organization.... The IETF is made up of **volunteers**, many of whom meet three times a year to fulfill the IETF mission. “
    - » From “The TAO of IETF”
- Process to adopt standards (later talk)

# Successful Standards

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- **OpenGIS Consortium:**
  - Background
    - 1993: time of object-oriented distributed computing
    - Small group is interested in defining **Open GIS:**
    - Define vendor-independent interoperable GIS interfaces
  - Standards Body: OpenGIS Consortium
    - Members, fees, board of directors
    - Standards are developed by members
    - Standards are easy to influence, and everyone can participate in the process
  - OGC went through several process models
    - Discussion approach (1<sup>st</sup> generation): 3 year turn around
    - RPF approach (2<sup>nd</sup> generation): 1 ½ year turn around
    - Testbed approach (3<sup>rd</sup> generation): ca. 6 months

# SEEDS and Standards?

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- Caution: Standards development is expensive
  - Leverage existing (commercial?) standards wherever possible
  - Adopt, profile, extend existing standards
  - Re-use commercial software products
- Nevertheless:
  - A *SEEDS Standards Body* and a *SEEDS Standards Process* are required
    - To identify, extend and adopt possible useful standards
  - Both need to accommodate the diverse communities
  - *Resources* to support standards identification, profiling, adoption, development

# Models for Standard Processes

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- Personal background
  - Used standards for distributed interoperable software platforms (CORBA) (pre-Java)
  - Worked with OpenGIS Consortium since 1995
  - Co-author and editor of OGC's "CORBA Simple Features"
- Study Group "Long-Term Standards and Standard Processes"
  - Group of people with experience in developing standards
  - Group investigated and analyzed a large variety of relevant standards and standard processes for ESE
  - Identification of Standards Needs relevant to ESE
  - Identification of successful Standard Process Models and Standards Bodies